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=> s electr######### (10a) (releas### or brok## or permeab######## or damag###)(10a)
cell#
2 FILES SEARCHED...
L1 7660 ELECTR######### (10A) (RELEAS### OR BROK## OR PERMEAB######## OR DAMAG###)(10A) CELL#

=>

=> s l1 and (bacterial or yeast# or plant or insect# or animal# or human)
2 FILES SEARCHED...
L2 4418 L1 AND (BACTERIAL OR YEAST# OR PLANT OR INSECT# OR ANIMAL# OR HUMAN)

=> s l2 and 50 volts
L3 0 L2 AND 50 VOLTS

=> s l2 and cell# suspension
L4 31 L2 AND CELL# SUSPENSION

=> s l4 and volt#
L5 0 L4 AND VOLT#

=> s l4 and voltage#
L6 1 L4 AND VOLTAGE#

=> d l6 bib ab kwic

L6 ANSWER 1 OF 1 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
AN 1988:357097 BIOSIS
DN BA86:52575
TI PERMEABILIZATION OF CULTIVATED **PLANT CELLS** BY **ELECTROPORATION** FOR **RELEASE** OF INTRACELLULARLY STORED SECONDARY PRODUCTS.
AU BRODELIUS P E; FUNK C; SHILLITO R D
CS INST. BIOTECHNOL., SWISS FED. INST. TECHNOL., HOENGGERBERG, CH-8093 ZURICH, SWITZERLAND.
SO PLANT CELL REP, (1988) 7 (3), 186-188.
CODEN: PCRPD8. ISSN: 0721-7714.
FS BA; OLD
LA English
AB **Plant cell suspension** cultures producing secondary metabolites have been **permeabilized** for product **release** by **electroporation**. The two **cell** cultures studied, i.e. Thalictrum rugosum and Chenopodium rubrum, require about 5 and 10 kV cm-1, respectively, for complete permeabilization (release of all the intracellularly stored product). The number of electrical pulses and capacitance used had a relatively limited effect on

product release while the viability of the cells was strongly influenced by the latter. Conditions for complete product release resulted in total loss of viability of the **cells** after treatment. The **release** of product from immobilized **cells** was also achieved by **electroporation**. **Cells** entrapped in alginate required less **voltage** for permeabilization than free or agarose entrapped cells.

TI PERMEABILIZATION OF CULTIVATED **PLANT CELLS** BY **ELECTROPORATION** FOR **RELEASE** OF INTRACELLULARLY STORED SECONDARY PRODUCTS.

AB **Plant cell suspension** cultures producing secondary metabolites have been **permeabilized** for product **release** by **electroporation**. The two **cell** cultures studied, i.e. Thalictrum rugosum and Chenopodium rubrum, require about 5 and 10 kV cm-1, respectively, for complete permeabilization (release. . . cells was strongly influenced by the latter. Conditions for complete product release resulted in total loss of viability of the **cells** after treatment. The **release** of product from immobilized **cells** was also achieved by **electroporation** . **Cells** entrapped in alginate required less **voltage** for permeabilization than free or agarose entrapped cells.

```
=> dup rem l4
PROCESSING COMPLETED FOR L4
L7             23 DUP REM L4  (8 DUPLICATES REMOVED)

=> d l7 1-23 bib ab kwic

L7   ANSWER 1 OF 23  BIOSIS  COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
AN   2002:233501  BIOSIS
DN   PREV200200233501
TI   Interdigitated microsensor electrode-chip for detection of cytotoxicity
     effect of Listeria monocytogenes from food.
AU   Naschansky, K. M. (1); Morgan, M. (1); Bhunia, A. K. (1)
CS   (1) Purdue University, West Lafayette, IN USA
SO   Abstracts of the General Meeting of the American Society for Microbiology,
     (2001) Vol. 101, pp. 563. http://www.asmusa.org/mtgsrc/generalmeeting.htm.
     print.
     Meeting Info.: 101st General Meeting of the American Society for
     Microbiology Orlando, FL, USA May 20-24, 2001
     ISSN: 1060-2011.
DT   Conference
LA   English
```

AB Several recent foodborne outbreaks of Listeria monocytogenes have focused our research efforts to sensitively detect low numbers of this microorganism from food using biosensor techniques. In this study, an interdigitated microsensor electrode (IME)-chip was used to detect cytopathogenic action of L. monocytogenes on a murine hybridoma B-lymphocyte, Ped-2E9 **cell** line using **electrical** impedance spectroscopy, which measures L. monocytogenes-induced **cell** membrane **damage**. The Listeria **cells** were added to a suspension of Ped-2E9 cells in a 100:1 multiplicity of infection and incubated for 1 h. Impedance data were generated by placing 20 microliters of the **cell suspension** onto a monolithic, IME-chip with gold electrodes spaced 15 micrometers apart and changes in membrane potential were determined using an impedance analyzer scanning over the frequency range of 1-10,000 KHz. The average impedance magnitude difference of 120 milliohms was detected between control Ped-2E9 cells and L. monocytogenes-damaged Ped-2E9 cells in the frequency range of 500-10,000 KHz after 3 min of settling time of Ped-2E9 cells on the IME-chip. This study confirms the ability of the IME-chip to detect Listeria-induced membrane damage in Ped-2E9 cells. Furthermore, experiments were conducted to capture and concentrate L. monocytogenes

from spiked hot dogs using immunomagnetic separation (IMS), employing anti-Listeria antibody-coated magnetic beads. Currently, we are using IMS-captured Listeria cells for cytopathogenicity testing by IME-chip. Preliminary data indicated the potential for use of the IME-chip system, in conjunction with IMS, to detect L. monocytogenes from food samples.

AB . . . an interdigitated microsensor electrode (IME)-chip was used to detect cytopathogenic action of L. monocytogenes on a murine hybridoma B-lymphocyte, Ped-2E9 **cell** line using **electrical** impedance spectroscopy, which measures L. monocytogenes-induced **cell** membrane **damage**. The Listeria **cells** were added to a suspension of Ped-2E9 cells in a 100:1 multiplicity of infection and incubated for 1 h. Impedance data were generated by placing 20 microliters of the **cell suspension** onto a monolithic, IME-chip with gold electrodes spaced 15 micrometers apart and changes in membrane potential were determined using an. . .

IT . . .
assays: analytical method, applications, description; interdigitated microsensor electrode chip: laboratory equipment, preparation, uses; spectroscopy: analytical method, photometry

IT Miscellaneous Descriptors
**bacterial** food contamination: detection methods; **bacterial** virulence: analysis, attenuation mechanisms, mechanism; biotechnology; food microbiology; food processing: environments; food samples: microbial analysis; foodborne infection outbreaks: analysis; Meeting. . .

L7 ANSWER 2 OF 23 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
AN 2001:346635 BIOSIS
DN PREV200100346635
TI Lipopolysaccharides from Burkholderia cepacia contribute to an enhanced defensive capacity and the induction of pathogenesis-related proteins in Nicotianae tabacum.
AU Coventry, Helen S.; Dubery, Ian A. (1)
CS (1) Department of Biochemistry, Rand Afrikaans University, Auckland Park, 2006: iad@na.rau.ac.za South Africa
SO Physiological and Molecular Plant Pathology, (April, 2001) Vol. 58, No. 4, pp. 149-158. print.
ISSN: 0885-5765.
DT Article
LA English
SL English
AB Lipopolysaccharides (LPS) from the outer cell wall of Gram-negative bacteria can influence the outcome of certain **plant**-pathogen interactions. LPS from an endophytic strain of Burkholderia cepacia, were purified and characterized by denaturing electrophoresis. A protective effect of LPS from Burkholderia cepacia on the Nicotianae tabacum-Phytophthora nicotianae interactions was found when plants were infected with zoospores of the pathogen. Progressive development of Black-shank disease symptoms occurred in the control plants while plants pre-treated with 100 mug ml-1 LPS remained unaffected. The LPS were found to possess activity as elicitors of **plant** defense responses in tobacco where the induction of PR-proteins was investigated by selective low pH extraction and **electrophoretic** analyses. Membrane permeability studies showed a dose dependent increase in **permeability** and of loss of **cell** viability due to the increasing toxic effect of higher concentrations (200-1000 mug ml-1) of LPS. The optimum concentration for PR-protein induction was found to be 75-100 mug ml-1, where the effect on cell permeability was minimal but induction was optimal. Time studies of 0-4 days, with 100 mug ml-1 LPS added to cell suspensions and leaf discs, showed an increase in intensity of protein bands with Mrs of 6cntdot5, 15, 17, 23, 33 and 35. These values correspond to PR-proteins from classes VI, IV, I, III, and II, respectively. Experiments were extended to include whole **plant** and leaves to compare the results obtained from the **cell**

**suspension** and leaf discs and were found to be similar with regard to the time and dose-dependent induction of PR-proteins. PR-proteins extracted from the leaves following **bacterial** inoculation of the roots indicated a systemic response which was also observed in upper leaves following treatment of lower leaves. The results are indicative of an enhanced defensive capacity due to pre-conditioning by the bio-active LPS.

AB Lipopolysaccharides (LPS) from the outer cell wall of Gram-negative bacteria can influence the outcome of certain **plant**-pathogen interactions. LPS from an endophytic strain of Burkholderia cepacia, were purified and characterized by denaturing electrophoresis. A protective effect of. . . while plants pre-treated with 100 mug ml-1 LPS remained unaffected. The LPS were found to possess activity as elicitors of **plant** defense responses in tobacco where the induction of PR-proteins was investigated by selective low pH extraction and **electrophoretic** analyses. Membrane permeability studies showed a dose dependent increase in **permeability** and of loss of **cell** viability due to the increasing toxic effect of higher concentrations (200-1000 mug ml-1) of LPS. The optimum concentration for PR-protein. . . These values correspond to PR-proteins from classes VI, IV, I, III, and II, respectively. Experiments were extended to include whole **plant** and leaves to compare the results obtained from the **cell suspension** and leaf discs and were found to be similar with regard to the time and dose-dependent induction of PR-proteins. PR-proteins extracted from the leaves following **bacterial** inoculation of the roots indicated a systemic response which was also observed in upper leaves following treatment of lower leaves.. . .

L7 ANSWER 3 OF 23 MEDLINE
AN 2001462094 MEDLINE
DN 21397866 PubMed ID: 11506979
TI Cell membrane electropermeabilization by symmetrical bipolar rectangular pulses. Part II. Reduced electrolytic contamination.
AU Kotnik T; Miklavcic D; Mir L M
CS Faculty of Electrical Engineering, University of Ljubljana, Trzaska 25, SI-1000 Ljubljana, Slovenia.. tadej@svarun.fe.uni-lj.si
SO BIOELECTROCHEMISTRY, (2001 Aug) 54 (1) 91-5.
Journal code: 100953583. ISSN: 1567-5394.
CY Netherlands
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200112
ED Entered STN: 20010820
Last Updated on STN: 20020122
Entered Medline: 20011204

AB The paper presents a comparative study of the contamination of a **cell suspension** by ions **released** from aluminum cuvettes (Al(3+)) and stainless steel **electrodes** (Fe(2+)/Fe(3+)) during **cell** membrane electropermeabilization by unipolar and by symmetrical bipolar rectangular electric pulses. A single pulse and a train of eight pulses were delivered to electrodes at a 2-mm distance, with 100-micros and 1-ms pulse durations, and amplitudes ranging from 0 to 400 V for unipolar, and from 0 to 280 V for bipolar pulses. We found that the released concentrations of Al(3+) and Fe(2+)/Fe(3+) were always more than one order of magnitude lower with bipolar pulses than with unipolar pulses of the same amplitude and duration. We then investigated the viability of DC-3F cells after 1 h of incubation in the medium containing different concentrations of Al(3+) or Fe(2+)/Fe(3+) within the range of measured released concentrations (up to 2.5 mM for both ions), thus separating the effects of electrolytic contamination from the effects of electropermeabilization itself. For Fe(2+)/Fe(3+), loss of cell viability became significant at concentrations above 1.5 mM, while for Al(3+), no

effect on cell survival was detected within the investigated range. Still, reports on the biochemical effects of released Al(3+) also suggest that with aluminum cuvettes, electrolytic contamination can be detrimental. Our study shows that electrolytic contamination and its detrimental effects can be largely reduced with no loss in efficiency of electropermeabilization, if bipolar rectangular pulses of the same amplitude and duration are used instead of the commonly applied unipolar pulses.

AB The paper presents a comparative study of the contamination of a **cell suspension** by ions **released** from aluminum cuvettes (Al(3+)) and stainless steel **electrodes** (Fe(2+)/Fe(3+)) during **cell** membrane electropermeabilization by unipolar and by symmetrical bipolar rectangular electric pulses. A single pulse and a train of eight pulses. . .

CT Check Tags: **Animal**; Support, Non-U.S. Gov't
Aluminum: AN, analysis
Cell Line, Transformed
*Cell Membrane Permeability
Cell Survival
Cricetulus
Electrolytes: AN, analysis
Hamsters
Iron:. . .

L7 ANSWER 4 OF 23 MEDLINE DUPLICATE 1
AN 2000250684 MEDLINE
DN 20250684 PubMed ID: 10788410
TI Differential damage in **bacterial** cells by microwave radiation on the basis of cell wall structure.
AU Woo I S; Rhee I K; Park H D
CS Department of Food Science and Technology, Kyungpook National University, Taegu, Korea.
SO APPLIED AND ENVIRONMENTAL MICROBIOLOGY, (2000 May) 66 (5) 2243-7.
Journal code: 7605801. ISSN: 0099-2240.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200006
ED Entered STN: 20000629
Last Updated on STN: 20000629
Entered Medline: 20000616

AB Microwave radiation in Escherichia coli and Bacillus subtilis cell suspensions resulted in a dramatic reduction of the viable counts as well as increases in the amounts of DNA and protein released from the cells according to the increase of the final temperature of the cell suspensions. However, no significant reduction of cell density was observed in either **cell suspension**. It is believed that this is due to the fact that most of the **bacterial cells** inactivated by microwave radiation remained unlysed. Scanning **electron** microscopy of the microwave-heated **cells** revealed severe **damage** on the surface of most E. coli **cells**, yet there was no significant change observed in the B. subtilis cells. Microwave-injured E. coli cells were easily lysed in the presence of sodium dodecyl sulfate (SDS), yet B. subtilis cells were resistant to SDS.

TI Differential damage in **bacterial** cells by microwave radiation on the basis of cell wall structure.

AB . . . increase of the final temperature of the cell suspensions. However, no significant reduction of cell density was observed in either **cell suspension**. It is believed that this is due to the fact that most of the **bacterial cells** inactivated by microwave radiation remained unlysed. Scanning **electron** microscopy of the microwave-heated **cells** revealed severe

**damage** on the surface of most E. coli **cells**, yet there was no significant change observed in the B. subtilis cells. Microwave-injured E. coli cells were easily lysed in. . .

CT Check Tags: Support, Non-U.S. Gov't
*Bacillus subtilis: RE, radiation effects
Bacillus subtilis: UL, ultrastructure
**Bacterial Proteins: RE, radiation effects**
Cell Count
Cell Wall: RE, radiation effects
Cell Wall: UL, ultrastructure
*Escherichia coli: RE, radiation effects
Escherichia coli: UL, ultrastructure
Heat
Microscopy, Electron, Scanning
*Microwaves
**RNA, Bacterial: RE, radiation effects**
CN 0 (**Bacterial** Proteins); 0 (RNA, **Bacterial**)

L7 ANSWER 5 OF 23 MEDLINE DUPLICATE 2
AN 2000193892 MEDLINE
DN 20193892 PubMed ID: 10727906
TI Study on DNA strand breaks induced by sodium nitroprusside, a nitric oxide donor, in vivo and in vitro.
AU Lin W; Wei X; Xue H; Kelimu M; Tao R; Song Y; Zhou Z
CS Department of Toxicology, Beijing Medical University, Beijing, People's Republic of China.. zhouzc@mail.bjmu.edu.cn
SO MUTATION RESEARCH, (2000 Mar 23) 466 (2) 187-95.
Journal code: 0400763. ISSN: 0027-5107.
CY Netherlands
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200005
ED Entered STN: 20000606
Last Updated on STN: 20000606
Entered Medline: 20000519
AB Nitric oxide (NO) as well as its donors has been shown to generate mutation and DNA damage in in vitro assays. The objective of this study was to identify that DNA single-strand breaks (SSBs) could be elicited by NO, not only in vitro but also in vivo. The alkaline single-**cell** gel **electrophoresis** (SCGE) was performed to examine the DNA **damage** in g12 **cells** and the **cells** isolated from the organs of mice exposed to sodium nitroprusside (SNP). A modified method, in which neither collagenase nor trypsin was necessary, was used to prepare the single-**cell suspension** isolated from organs of mice. Results showed that the exposure of g12 cells to 0.13-0.5 micromol/ml SNP with S9 for 1 h induced a concentration-dependent increase in DNA SSBs in g12 cells. The significant increase in DNA migration and comet frequency has appeared in the cells isolated from the spleen, thymus, and peritoneal macrophages of mice after injecting i.p. SNP in the dosage range of 0.67-6.0 mg/kg b.wt for 1 h. However, no obvious increase in DNA strand breaks was observed in the cells isolated from the liver, kidney, lung, brain and heart obtained from the same treated mice. These results suggested that DNA SSBs could be induced by NO in some cells both in vivo and in vitro. There were organ differences in sensitivity in the mice exposed to NO. Spleen, thymus, and macrophages might be the important targets of NO.
AB . . . that DNA single-strand breaks (SSBs) could be elicited by NO, not only in vitro but also in vivo. The alkaline single-**cell** gel **electrophoresis** (SCGE) was performed to examine the DNA **damage** in g12 **cells** and the **cells** isolated from the organs of mice exposed to sodium nitroprusside (SNP). A modified method, in which neither collagenase nor trypsin was necessary, was used to prepare the single-**cell suspension** isolated from

organs of mice. Results showed that the exposure of g12 cells to 0.13-0.5 micromol/ml SNP with S9 for. . .

CT Check Tags: **Animal**; Male; Support, Non-U.S. Gov't
Akathisia, Drug-Induced: ET, etiology
Cell Line
Cells, Cultured
Comet Assay
Cyanosis: CI, chemically induced
*DNA: DE,. . .

L7 ANSWER 6 OF 23 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
AN 2001:120688 BIOSIS
DN PREV200100120688
TI Transmission electron microscopic evidence for mitochondrial swelling and cell death in dopaminergic neuronal cell suspensions.
AU Emgard, M. (1); Brundin, P.
CS (1) Dept Physiol Sci, Lund Sweden
SO Society for Neuroscience Abstracts, (2000) Vol. 26, No. 1-2, pp. Abstract No.-667.6. print.
Meeting Info.: 30th Annual Meeting of the Society of Neuroscience New Orleans, LA, USA November 04-09, 2000 Society for Neuroscience . ISSN: 0190-5295.
DT Conference
LA English
SL English
AB The survival of dopaminergic neurons in dissociated ventral mesencephalon (VM) grafts is only around 5-20%. Most of the neurons die during the grafting procedure or within 6 days of implantation (Emgard et al. Exp. Neurol.160: 279-288). We have now studied the morphology of VM cell suspensions prior to transplantation. Rat embryonic (day 14) VMs were dissected and prepared identically as for transplantation. Cell suspensions were incubated in room temperature followed by various incubation times in 37degreeC. Whole pieces of VM and **cell suspension** taken directly after preparation were used as controls for tissue with minimal cell death, and staurosporine was used as an inducer of maximal apoptotic cell death. Cell suspensions were fixed and thereafter prepared for electron microscopy. Cell size, membrane morphology, chromatin condensation, organelle disruption and mitochondrial swelling were studied as indices of **cell damage** and death. **Electron** microscopic findings were compared with **cell** viability assessed by trypan blue exclusion. We observed progressive increases in the frequency of cells exhibiting damage, and in the severity of changes with increasing incubation times. Several **cells** exhibited apoptotic morphology. There were morphological changes indicative of **cell damage** preceding the appearance of membrane leakage to trypan blue. Thus, **electron** microscopy seems to provide a sensitive means to detect **cell damage** in VM **cell** suspensions. Ongoing experiments are examining the impact of pretreating the cells with known neuroprotective agents and trying to define at what stage the cellular damage has reached the point of no return.
AB. . . transplantation. Cell suspensions were incubated in room temperature followed by various incubation times in 37degreeC. Whole pieces of VM and **cell suspension** taken directly after preparation were used as controls for tissue with minimal cell death, and staurosporine was used as an. . . prepared for electron microscopy. Cell size, membrane morphology, chromatin condensation, organelle disruption and mitochondrial swelling were studied as indices of **cell damage** and death. **Electron** microscopic findings were compared with **cell** viability assessed by trypan blue exclusion. We observed progressive increases in the frequency of cells exhibiting damage, and in the severity of changes with increasing incubation times. Several **cells** exhibited apoptotić morphology. There were morphological changes indicative of **cell damage** preceding the

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ORGN Super Taxa
Muridae: Rodentia, Mammalia, Vertebrata, Chordata, Animalia
ORGN Organism Name
rat (Muridae): embryo
ORGN Organism Superterms
**Animals**; Chordates; Mammals; Nonhuman Mammals; Nonhuman Vertebrates; Rodents; Vertebrates

L7 ANSWER 7 OF 23 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
AN 2000:251691 BIOSIS
DN PREV200000251691
TI Studies on DNA single strand breaks induced by sodium nitroprusside-nitric oxide donor.
AU Lin Weici (1); Wei Xuetao (1); Kelimu, Maimaiti (1)
CS (1) Department of Toxicology, Beijing Medical University, Beijing, 100083 China
SO Zhonghua Yufang Yixue Zazhi, (Nov., 1999) Vol. 33, No. 6, pp. 360-362. ISSN: 0253-9624.
DT Article
LA Chinese
SL Chinese; English
AB Objective To study the effect of sodium nitroprusside (SNP), a nitric oxide (NO) donor, on DNA single strand breaks (SSBs). Methods A modified method was used to isolate and prepare the single **cell** **suspension** from the organs of mice. Alkaline single-**cell** gel **electrophoresis** (SCGE) was performed to examine DNA **damage** of the **cells** treated by SNP in vivo and in vitro. Results Treatment with 0.5 - 2.0 mumol/ml of SNP with S9 for 1 h induced a concentration-dependent increase in DNA SSBs in g12 cells. Significant increase in DNA migration and comet frequency in the spleen, thymus and peritoneal macrophage were induced after intraperitoneal injection of SNP at a dose of 0.67 - 6.0 mg/kg. No obvious increase in DNA single strand breaks was observed in the liver, kidney and lung of the mice with same treatment. Conclusion DNA SSBs could be induced by NO in some cells in vivo and in vitro. There was difference in sensitivity of various organs in the mice to NO. Cells of spleen and thymus and macrophage may be the important target cells of NO.
AB. . . (NO) donor, on DNA single strand breaks (SSBs). Methods A modified method was used to isolate and prepare the single **cell** **suspension** from the organs of mice. Alkaline single-**cell** gel **electrophoresis** (SCGE) was performed to examine DNA **damage** of the **cells** treated by SNP in vivo and in vitro. Results Treatment with 0.5 - 2.0 mumol/ml of SNP with S9 for. . .
ORGN Super Taxa
Muridae: Rodentia, Mammalia, Vertebrata, Chordata, Animalia
ORGN Organism Name
mouse (Muridae)
ORGN Organism Superterms
**Animals**; Chordates; Mammals; Nonhuman Mammals; Nonhuman Vertebrates; Rodents; Vertebrates

L7 ANSWER 8 OF 23 MEDLINE DUPLICATE 3
AN 1999272865 MEDLINE
DN 99272865 PubMed ID: 10341032
TI Electric field pulses can induce apoptosis.
AU Hofmann F; Ohnimus H; Scheller C; Strupp W; Zimmermann U; Jassoy C
CS Lehrstuhl fur Biotechnologie, Biozentrum, D-97074 Wurzburg, Germany.
SO JOURNAL OF MEMBRANE BIOLOGY, (1999 May 15) 169 (2) 103-9. Journal code: 0211301. ISSN: 0022-2631.

CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199907
ED Entered STN: 19990730
Last Updated on STN: 19990730
Entered Medline: 19990722
AB Injection of electric field pulses of high intensity (kV/cm) and short duration (microsecond range) into a **cell suspension** results in a temporary increase of the membrane **permeability** due to a reversible **electric** breakdown of the **cell** membrane. Here we demonstrate that application of supercritical field pulses between 4. 5 and 8.1 kV/cm strength and 40 microsec duration induce typical features of apoptosis in Jurkat T-lymphoblasts and in HL-60 cells including DNA fragmentation and cleavage of the poly(ADP ribose) polymerase. Apoptosis induction did not depend on the presence of any particular electrolyte in the extracellular medium. However, no apoptosis was observed in solutions without a minimum amount of salt. Apoptotic DNA fragmentation was prevented by the caspase inhibitor zVAD.
AB Injection of electric field pulses of high intensity (kV/cm) and short duration (microsecond range) into a **cell suspension** results in a temporary increase of the membrane **permeability** due to a reversible **electric** breakdown of the **cell** membrane. Here we demonstrate that application of supercritical field pulses between 4. 5 and 8.1 kV/cm strength and 40 microsec. . .
CT Check Tags: **Human**; Support, Non-U.S. Gov't
*Apoptosis
Caspases: ME, metabolism
Culture Media
DNA Fragmentation
*Electric Stimulation
Electroporation
Enzyme Activation
HL-60 Cells
Ions
Jurkat. . .

L7 ANSWER 9 OF 23 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
AN 1999:212578 BIOSIS
DN PREV199900212578
TI Chinese hamster ovary cells sensitivity to localized electrical stresses.
AU Vernhes, M.-C.; Cabanes, P.-A.; Teissie, J. (1)
CS (1) Institut de Pharmacologie et de Biologie Structurale, CNRS UPR 9062, 118 route de Narbonne, 31062, Toulouse cedex France
SO Bioelectrochemistry and Bioenergetics, (Feb., 1999) Vol. 48, No. 1, pp. 17-25.
ISSN: 0302-4598.
DT Article
LA English
SL English
AB Application of an external electric field on a **cell suspension** induces an alteration in the membrane structure giving free access to the cell cytoplasm. Under mild pulsation conditions, permeabilization is a reversible process which weakly affects cell viability while drastic electrical conditions lead to cell death. The field pulse must be considered as a complex stress applied on the cell assembly. This study is a systematic investigation of the stress effects of field strength, pulse duration and number of pulses, at given joule energy. The loss in cell viability is not related to the energy delivered to the system. At a given joule energy, a strong field during a short cumulated pulse duration affects more viability than using a weak field associated with a long cumulated pulsation. At a given field strength and for a given cumulated pulse duration an accumulation of short pulses is

also observed to be very damaging for cells. A control by the delay between the pulses suggests a memory effect. The field effect appears also to be vectorial in line with the known asymmetry of the membrane organization. These results suggest that processes at a cellular level are involved, either an activation of cell death or damage in cellular functions.

AB Application of an external electric field on a **cell suspension** induces an alteration in the membrane structure giving free access to the cell cytoplasm. Under mild pulsation conditions, permeabilization is. . .

IT Miscellaneous Descriptors
cell death; cell physiology; cellular stress; cellular survival; **electroinduced cell damage**; pulsed electric fields: cellular effects

ORGN . . .
Mammalia, Vertebrata, Chordata, Animalia; Mammalia: Vertebrata, Chordata, Animalia

ORGN Organism Name
mammal (Mammalia); CHO cell line (Cricetidae)

ORGN Organism Superterms
**Animals**; Chordates; Mammals; Nonhuman Mammals; Nonhuman Vertebrates; Rodents; Vertebrates

L7 ANSWER 10 OF 23 MEDLINE DUPLICATE 4
AN 97177743 MEDLINE
DN 97177743 PubMed ID: 9123652
TI Biophysical effects of high-energy pulsed ultrasound on **human** cells.
AU Feigl T; Volklein B; Iro H; Ell C; Schneider T
CS Department of ENT, University of Erlangen-Nuremberg, Germany.
SO ULTRASOUND IN MEDICINE AND BIOLOGY, (1996) 22 (9) 1267-75.
Journal code: 0410553. ISSN: 0301-5629.
CY ENGLAND: United Kingdom
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199704
ED Entered STN: 19970506
Last Updated on STN: 19970506
Entered Medline: 19970421

AB **Human** benign and malignant cells of different **human** origin (pancreas, liver, kidney, pharynx, tongue, lip) were exposed to high-energy pulsed ultrasound (HEPUS) in vitro to evaluate the effects of various physical parameters and sonication conditions on cell viability. This included the number of pulses, focal pressure, pulse repetition rate, pulse shape, **cell suspension** volume, water level of the basin and cell density. Cell viability was found to depend significantly on the number of pulses (exponential), the focal pressure (linear) and the pulse repetition rate (minimum at 1 Hz). Other parameters showed no marked influence. Furthermore, **electron** microscopy revealed intracellular **damage**, and proliferation rates of **cells** surviving sonication were normal after HEPUS exposure. The experimental piezoelectric ultrasound transducer used in the experiments generated oscillating bipolar pulses with high negative pressure amplitudes. Measurements were made of the pulse shape and ultrasonic field of the experimental device and of a conventional lithotripter for comparison.

TI Biophysical effects of high-energy pulsed ultrasound on **human** cells.

AB **Human** benign and malignant cells of different **human** origin (pancreas, liver, kidney, pharynx, tongue, lip) were exposed to high-energy pulsed ultrasound (HEPUS) in vitro to evaluate the effects. . . parameters and sonication conditions on cell viability. This included the number of pulses, focal pressure, pulse repetition rate, pulse shape,

**cell suspension** volume, water level of the basin and cell density. Cell viability was found to depend significantly on the number of. . . the focal pressure (linear) and the pulse repetition rate (minimum at 1 Hz). Other parameters showed no marked influence. Furthermore, **electron** microscopy revealed intracellular **damage**, and proliferation rates of **cells** surviving sonication were normal after HEPUS exposure. The experimental piezoelectric ultrasound transducer used in the experiments generated oscillating bipolar pulses. . .

CT Check Tags: Comparative Study; **Human**
Biopsy
Cell Division
Cell Line
Cell Survival
Fibroblasts: EN, enzymology
*Fibroblasts: US, ultrasonography
Lactate Dehydrogenase: ME, metabolism
Liver: CY, cytology

. . .

L7 ANSWER 11 OF 23 MEDLINE
AN 96093310 MEDLINE
DN 96093310 PubMed ID: 8532754
TI The influence of membrane **permeability** for ions on **cell** behaviour in an **electric** alternating field.
AU Despa S
CS Biotehnos SA, Biophysics Laboratory, Bucharest, Romania.
SO PHYSICS IN MEDICINE AND BIOLOGY, (1995 Sep) 40 (9) 1399-409. Journal code: 0401220. ISSN: 0031-9155.
CY ENGLAND: United Kingdom
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199601
ED Entered STN: 19960220
Last Updated on STN: 19980206
Entered Medline: 19960126
AB The behaviour of a cell in an electric alternating field has been investigated, taking into account the field-induced diffusion flows of ions through the membrane. We computed the difference in ion concentration between the internal and external sides of the membrane and the transmembrane diffusion potential induced by the external field. We also studied the effects of these flows on dielectric properties of a tissue in the radio frequency range. The value of the electric permittivity at low frequencies decreases gradually with the increase of membrane permeability for ions, while the electric permittivity at high frequencies is unchanged. These effects are especially important for analysis of the dielectric spectrum of a tissue or **cell suspension** which has undergone the influence of various physical or chemical agents, e.g. ionizing radiation or detergents.
TI The influence of membrane **permeability** for ions on **cell** behaviour in an **electric** alternating field.
AB . . . at high frequencies is unchanged. These effects are especially important for analysis of the dielectric spectrum of a tissue or **cell suspension** which has undergone the influence of various physical or chemical agents, e.g. ionizing radiation or detergents.
CT Check Tags: **Animal**
Cell Membrane: PH, physiology
*Cell Membrane Permeability
*Cell Physiology
Electrophysiology
Mathematics
*Membrane Potentials

*Models, Biological

L7 ANSWER 12 OF 23 MEDLINE DUPLICATE 5
AN 93120449 MEDLINE
DN 93120449 PubMed ID: 1282374
TI Electroporation and electrophoretic DNA transfer into cells. The effect of DNA interaction with electropores.
AU Sukharev S I; Klenchin V A; Serov S M; Chernomordik L V; Chizmadzhev YuA
CS Frumkin Institute of Electrochemistry, Moscow, Republic of Russia.
SO BIOPHYSICAL JOURNAL, (1992 Nov) 63 (5) 1320-7.
Journal code: 0370626. ISSN: 0006-3495.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199302
ED Entered STN: 19930226
Last Updated on STN: 19960129
Entered Medline: 19930210
AB It has been shown recently that electrically induced DNA transfer into cells is a fast vectorial process with the same direction as DNA electrophoresis in an external electric field (Klenchin, V. A., S. I. Sukharev, S. M. Serov, L. V. Chernomordik, and Y. A. Chizmadzhev. 1991. Biophys. J. 60:804-811). Here we describe the effect of DNA interaction with membrane electropores and provide additional evidences for the key role of DNA electrophoresis in cell electrotransfection. The assay of electrically induced uptake of fluorescent dextrans (FDs) by **cells** shows that the presence of DNA in the medium during **electroporation** leads to a sharp increase in membrane **permeability** to FDs of M(r) < 20,000. The permeability increases with DNA concentration and the effect is seen even if FD is added to the **cell suspension** a few minutes after pulse application.
The longer the DNA fragment, the greater the increase in permeability. The use of a two-pulse technique allows us to separate two effects provided by a pulsed electric field: membrane electroporation and DNA electrophoresis. The first pulse (6 kV/cm, 10 microseconds) creates pores efficiently, whereas transfection efficiency (TE) is low. The second pulse of much lower amplitude, but substantially longer (0.2 kV/cm, 10 ms), does not cause poration and transfection by itself but enhances TE by about one order of magnitude. In two-pulse experiments, TE rises monotonously with the increase of the second pulse duration. By varying the delay duration between the two pulses, we estimate the lifetime of electropores (which are DNA-permeable in conditions of low electric field) as tens of seconds.(ABSTRACT TRUNCATED AT 250 WORDS)
AB . . . the key role of DNA electrophoresis in cell electrotransfection. The assay of electrically induced uptake of fluorescent dextrans (FDs) by **cells** shows that the presence of DNA in the medium during **electroporation** leads to a sharp increase in membrane **permeability** to FDs of M(r) < 20,000. The permeability increases with DNA concentration and the effect is seen even if FD is added to the **cell suspension** a few minutes after pulse application.
The longer the DNA fragment, the greater the increase in permeability. The use of. . .
CT Check Tags: **Animal**
Biophysics
Cell Line
Cell Membrane: ME, metabolism
*DNA: AD, administration & dosage
*DNA: GE, genetics
Dextrans
Electricity
Electrophoresis
Evaluation Studies
. . .

L7 ANSWER 13 OF 23 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
AN 1993:71831 BIOSIS
DN PREV199395036331
TI On the mechanism of electrically induced DNA transfer through the cell plasma membrane: DNA interaction with electropores affected by the electrophoretic force.
AU Sukharev, S. I. (1); Klenchin, V. A.; Serov, S. M.; Chernomordik, L. V.; Chizmadzhev, Yu. A.
CS (1) A.N. Frumkin Inst. Electrochem., Acad. Sci. Russ., Moscow Russia
SO Biologicheskie Membrany (Moscow), (1992) Vol. 9, No. 4, pp. 405-419. ISSN: 0233-4755.
DT Article
LA Russian
SL Russian; English
AB Recently we have shown that electrically induced DNA transfer into cells is a fast vectorial process of the same direction as DNA electrophoresis in an external electric field (Klenchin V. A., Sukharev S. 1., Serov S. M., Chernomordik L. V., Chizmadzhev Yu. A., Biological Membranes (cover-to-cover translation) 7: 1146-1162 (1991)). In the present work, we describe the effect of DNA interaction with membrane electropores and provide additional evidence for the key role of DNA electrophoresis in the mechanism of cell electrotransfection. The assay of electrically induced uptake of fluorescent dextrans (FDs) by **cells** showed that the presence of DNA in the medium during **electroporation** leads to a sharp increase of membrane **permeability** for FDs of molecular weights under 20 kDa. Membrane permeability increased with DNA concentration and the effect could be seen even if FDs were added to the **cell suspension** a few minutes after the pulse was applied. The larger was the DNA fragment, the greater the increase in permeability. The use of the two-pulse technique allowed us to separate two effects exerted by pulsed electric field: membrane electroporation and DNA electrophoresis. The first pulse (6 kV/cm, 10 mu-s) created pores efficiently while the transfection efficiency (TE) was low. The second pulse of much lower amplitude but substantially longer (200 V/cm, 10 ms) caused no poration and transfection by itself but enhanced TE by about one order of magnitude. In double-pulse experiments, TE rose monotonously with the duration of the second pulse. The increased delay between the two pulses led to a decrease in TE. The variation of delay duration allowed us to estimate the lifetime (tau-1/2) of electropores (which are permeable for DNA under conditions of low electric field strength) to be approximately tens of seconds. The direct correlation between TE level and FD uptake by cells was also revealed by two-pulse experiments. The data suggest that the basis of the mechanism of cell electrotransfection is electrophoretic movement of DNA through membrane pores whose size is determined by interaction with DNA in an electric field.
AB. . . of DNA electrophoresis in the mechanism of cell electrotransfection. The assay of electrically induced uptake of fluorescent dextrans (FDs) by **cells** showed that the presence of DNA in the medium during **electroporation** leads to a sharp increase of membrane **permeability** for FDs of molecular weights under 20 kDa. Membrane permeability increased with DNA concentration and the effect could be seen even if FDs were added to the **cell suspension** a few minutes after the pulse was applied. The larger was the DNA fragment, the greater the increase in permeability.. . .
ORGN Super Taxa
Animalia - Unspecified: Animalia
ORGN Organism Name
**animal** (Animalia - Unspecified); Animalia (Animalia - Unspecified)
ORGN Organism Superterms
**animals**

L7 ANSWER 14 OF 23 MEDLINE

AN 92075881 MEDLINE
DN 92075881 PubMed ID: 1660315
TI Electrically induced DNA uptake by cells is a fast process involving DNA electrophoresis.
AU Klenchin V A; Sukharev S I; Serov S M; Chernomordik L V; Chizmadzhev YuA
CS Frumkin Institute of Electrochemistry, USSR Academy of Sciences, Moscow.
SO BIOPHYSICAL JOURNAL, (1991 Oct) 60 (4) 804-11.
Journal code: 0370626. ISSN: 0006-3495.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199201
ED Entered STN: 19920202
Last Updated on STN: 19920202
Entered Medline: 19920114
AB Simian Cos-1 cells were transfected electrically with the plasmid pCH110 carrying the beta-galactosidase gene. The efficiency of transfection was determined by a transient expression of this gene. When the plasmid was introduced into a **cell suspension** 2 s after pulse application, the transfection efficiency was shown to be less than 1% as compared with a prepulse addition of DNA. Addition of DNAase to suspension immediately after a pulse did not decrease transfection efficiency, thus the time of DNA translocation was estimated to be less than 3 s. The use of electric treatment medium, in which the postpulse colloid-osmotic cell swelling was prevented, did not affect the transfection efficiency. These results contradict both assumptions of free DNA diffusion into cell through the long-lived pores and of involvement of osmotic effects in DNA translocation. Transfection of cells in monolayer on a porous film allowed creation of the spatial asymmetry of cell-plasmid interaction along the direction of electric field applied. A pulse with a polarity inducing DNA electrophoresis toward the cells resulted in the 10-fold excess of transfection efficiency compared with a pulse with reverse polarity. Ficoll (10%) which increases medium viscosity or Mg2+ ions (10 mM) which decrease the effective charge of DNA, both reduced transfection efficiency 2-3-fold. These results prove a significant role of DNA **electrophoresis** in the phenomenon considered. The **permeability** of **cell** membranes for an indifferent dye was shown to increase noticeably if the cells were pulsed in the presence of DNA. This indicates a possible interaction of DNA translocated with the pores in an electric field, that results in pore expansion.
AB . . . The efficiency of transfection was determined by a transient expression of this gene. When the plasmid was introduced into a **cell suspension** 2 s after pulse application, the transfection efficiency was shown to be less than 1% as compared with a prepulse. . . which decrease the effective charge of DNA, both reduced transfection efficiency 2-3-fold. These results prove a significant role of DNA **electrophoresis** in the phenomenon considered. The **permeability** of **cell** membranes for an indifferent dye was shown to increase noticeably if the cells were pulsed in the presence of DNA.. . .
CT Check Tags: **Animal**
Biological Transport
Cell Line
*Cell Membrane Permeability
***DNA, Bacterial: GE, genetics**
**DNA, Bacterial: ME, metabolism**
*DNA, Viral: GE, genetics
DNA, Viral: ME, metabolism
Electric Stimulation
Escherichia coli: EN, enzymology
Escherichia coli:. . .
CN 0 (DNA, **Bacterial**); 0 (DNA, Viral); 0 (Plasmids); EC 3.2.1.23 (beta-Galactosidase)

L7 ANSWER 15 OF 23 MEDLINE DUPLICATE 6
AN 90330845 MEDLINE
DN 90330845 PubMed ID: 2376670
TI Combined effects of hyperthermia (to 45 degrees C) and ultrasound irradiation on the surface ultrastructure of HeLa cells.
AU Shammari M A; Watmough D J; Kerr C L; Gregory D W; Wheatley D N
CS Department of Bio-Medical Physics, Foresterhill, Aberdeen, Scotland, UK.
SO INTERNATIONAL JOURNAL OF HYPERTHERMIA, (1990 May-Jun) 6 (3) 571-80.
Journal code: 8508395. ISSN: 0265-6736.
CY ENGLAND: United Kingdom
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199009
ED Entered STN: 19901012
Last Updated on STN: 19970203
Entered Medline: 19900904
AB Hyperthermic treatment of HeLa cells in suspension combined with ultrasound irradiation produced alterations to the cell surfaces. The changes induced were related to ultrasound intensity in the standing wave and to heat treatments between 37 and 45 degrees C. Two transducers were used, driven at resonant frequencies of 0.75 and 1.5 MHz, and producing peak intensities up to 7 W/cm2. These intensities produced a negligible rise in temperature of the **cell suspension** medium. Ultrastructural **damage** in standing wave fields, as seen by scanning **electron** microscopy, progressed through stages. The first stage was characterized by the loss of microvilli and smooth appearance of the cell surface, e.g. after insonation at 41.5 degrees C for 10 min; damage increased to a final stage where the surface appeared heavily pitted and porous, with the cells showing signs of disintegration, e.g. after insonation at 45 degrees C for 10 min. The monitoring of ultrasound-induced cavitation suggested that damage was caused by bubble oscillations, not collapse cavitation. Shearing stresses accentuated by hyperthermia were considered the probable cause of such damage. Coulter counter studies of cell size distribution showed that the extent of cell damage depended on the geometry of the vessel in which insonation was carried out.
AB . . . 1.5 MHz, and producing peak intensities up to 7 W/cm2. These intensities produced a negligible rise in temperature of the **cell suspension** medium. Ultrastructural **damage** in standing wave fields, as seen by scanning **electron** microscopy, progressed through stages. The first stage was characterized by the loss of microvilli and smooth appearance of the cell. . .
CT Check Tags: **Human**; Support, Non-U.S. Gov't
*Cell Membrane: UL, ultrastructure
*Heat
Hela Cells
Microscopy, Electron, Scanning
Microvilli: UL, ultrastructure
*Ultrasonics

L7 ANSWER 16 OF 23 CAPLUS COPYRIGHT 2003 ACS
AN 1990:152278 CAPLUS
DN 112:152278
TI Importance of catecholamine release for the functional action of intrastriatal implants of adrenal medullary cells: pharmacological analysis and in vivo electrochemistry
AU Decombe, R.; Rivot, J. P.; Aunis, D.; Abrous, N.; Peschanski, M.; Herman, J. P.
CS Univ. Bordeaux II, Bordeaux, 33077, Fr.
SO Experimental Neurology (1990), 107(2), 143-53
CODEN: EXNEAC; ISSN: 0014-4886
DT Journal

LA English
AB To test whether adrenal chromaffin cells implanted into the striatum of rats could exert a functional effect through a release of catecholamines, a **cell suspension** obtained from bovine adrenal medulla was implanted unilaterally into the striatum. The striatal dopaminergic input was extensively destroyed beforehand to preclude the possibility of reinnervation of the striatum by endogenous dopaminergic neurons. The functional influence of the implant was tested through the measurement of drug-induced rotation, and catecholamine release was measured subsequently in the same **animals** by in vivo electrochem. Transplant survival, as shown by the immunohistochem. anal. performed at the end of the in vivo expts., was highly variable. Surviving chromaffin cells maintained their endocrine morphol. and no reinnervation of the host-striatum could be detected. Rotation of the **animals** evoked by apomorphine (0.1 mg/kg, s.c.) or amphetamine (5.0 mg/kg, i.p.) following the lesion was left uninfluenced following transplantation, even when a large transplant was recovered. On the other hand, nicotine (0.5 mg/kg, s.c.) evoked a strong contraversive rotational response in the transplant-bearing **animals**. This response could not be ascribed to the central effect of substances released peripherally and entering the nervous system through the blood-brain barrier opened by the implantation procedure, as it could not be found in **animals** bearing implants of other peripheral endocrine tissue, viz, pituitary. The effect of nicotine was not blocked by the pretreatment of the **animals** with either the opiate antagonist naloxone (2.5 mg/kg, 10 min) or the dopamine receptor blocker pimozide (0.5 mg/kg, 1 h), although the latter pretreatment blocked the amphetamine-evoked rotation. No spontaneous catecholamine release could be detected from the implanted chromaffin **cells** by in vivo **electrochem**., whereas treatment with amphetamine or nicotine did evoke a **release**. Thus, the functional effects of such intrastriatal grafts of chromaffin cells, reported in previous studies, cannot by explained by the secretion from the grafted cells of catecholamines into the denervated striatum. However, adrenal grafts can, under suitable conditions, influence the functioning of the host nervous system.
AB To test whether adrenal chromaffin cells implanted into the striatum of rats could exert a functional effect through a release of catecholamines, a **cell suspension** obtained from bovine adrenal medulla was implanted unilaterally into the striatum. The striatal dopaminergic input was extensively destroyed beforehand to preclude the possibility of reinnervation of the striatum by endogenous dopaminergic neurons. The functional influence of the implant was tested through the measurement of drug-induced rotation, and catecholamine release was measured subsequently in the same **animals** by in vivo electrochem. Transplant survival, as shown by the immunohistochem. anal. performed at the end of the in vivo expts., was highly variable. Surviving chromaffin cells maintained their endocrine morphol. and no reinnervation of the host-striatum could be detected. Rotation of the **animals** evoked by apomorphine (0.1 mg/kg, s.c.) or amphetamine (5.0 mg/kg, i.p.) following the lesion was left uninfluenced following transplantation, even when a large transplant was recovered. On the other hand, nicotine (0.5 mg/kg, s.c.) evoked a strong contraversive rotational response in the transplant-bearing **animals**. This response could not be ascribed to the central effect of substances released peripherally and entering the nervous system through the blood-brain barrier opened by the implantation procedure, as it could not be found in **animals** bearing implants of other peripheral endocrine tissue, viz, pituitary. The effect of nicotine was not blocked by the pretreatment of the **animals** with either the opiate antagonist naloxone (2.5 mg/kg, 10 min) or the dopamine receptor blocker pimozide (0.5 mg/kg, 1 h), although the latter pretreatment blocked the amphetamine-evoked rotation. No spontaneous catecholamine release could be detected from the implanted chromaffin **cells** by in vivo **electrochem**., whereas treatment with amphetamine or nicotine did evoke a **release**. Thus, the

functional effects of such intrastriatal grafts of chromaffin cells, reported in previous studies, cannot by explained by the secretion from the grafted cells of catecholamines into the denervated striatum. However, adrenal grafts can, under suitable conditions, influence the functioning of the host nervous system.

IT Transplant and Transplantation, **animal**
(of adrenal medulla chromaffin cell, in striatum, catecholamine release by, behavior in relation to)

L7 ANSWER 17 OF 23 CAPLUS COPYRIGHT 2003 ACS
AN 1989:208876 CAPLUS
DN 110:208876
TI A novel method-a "freeze-blast" method-to disrupt microbial cells
AU Omori, Yoshiyuki; Ichida, Taizo; Ukita, Rie; Osumi, Masako; Ueda, Mitsuyoshi; Tanaka, Atsuo
CS Tech. Inst., Taiyo Sanso Co., Ltd., Kawaguchi, 332, Japan
SO Journal of Fermentation and Bioengineering (1989), 67(1), 52-6
CODEN: JFBIEX; ISSN: 0922-338X
DT Journal
LA English

AB A novel method to disintegrate cells by rapidly blowing a frozen **cell suspension** at a high N gas flow against a target panel, i.e., a freeze-blast method, was used on n-alkane-grown cells of Candida tropicalis pK 233 to ext. several useful substances. **Electron** microscopical observation revealed that the **yeast cells** were **broken** into large fragments. Recovery of sol. enzymes (catalase and citrate synthase) with this method was comparable to that with the glass-beads and ultrasonication methods. A large part of membrane-assocd. enzymes (NADPH-cytochrome c reductase, long-chain alc. dehydrogenase, and ATPase) remained bound after disruption, and could be solubilized with 0.5% (w/v) Triton X-100. Under hypertonic conditions, mitochondria were isolated directly without the pretreatment of the **yeast** cells with a lytic enzyme. Agarose gel electrophoresis followed by Northern blot anal. showed that this method was also convenient for isolating RNAs from the cells. These results demonstrate that the freeze-blast method offers a novel technique to disrupt microbial cells, which might be applicable to other classes of cells.

AB A novel method to disintegrate cells by rapidly blowing a frozen **cell suspension** at a high N gas flow against a target panel, i.e., a freeze-blast method, was used on n-alkane-grown cells of Candida tropicalis pK 233 to ext. several useful substances. **Electron** microscopical observation revealed that the **yeast cells** were **broken** into large fragments. Recovery of sol. enzymes (catalase and citrate synthase) with this method was comparable to that with the glass-beads and ultrasonication methods. A large part of membrane-assocd. enzymes (NADPH-cytochrome c reductase, long-chain alc. dehydrogenase, and ATPase) remained bound after disruption, and could be solubilized with 0.5% (w/v) Triton X-100. Under hypertonic conditions, mitochondria were isolated directly without the pretreatment of the **yeast** cells with a lytic enzyme. Agarose gel electrophoresis followed by Northern blot anal. showed that this method was also convenient for isolating RNAs from the cells. These results demonstrate that the freeze-blast method offers a novel technique to disrupt microbial cells, which might be applicable to other classes of cells.

ST microorganism cell disruption freeze blast; **yeast** cell disruption; mitochondria isolation microbe cell; RNA isolation microbe cell; membrane enzyme isolation microbe cell

L7 ANSWER 18 OF 23 CAPLUS COPYRIGHT 2003 ACS
AN 1988:569001 CAPLUS
DN 109:169001
TI Release of cellular contents with high-intensity electrical impulses

IN  Brodelius, Peter; Shillito, Raymond Douglas; Potrykus, Ingo
PA  Ciba-Geigy A.-G., Switz.
SO  Ger. Offen., 11 pp.
    CODEN: GWXXBX
DT  Patent
LA  German
FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|---|
| PI | DE 3733927 | A1 | 19880414 | DE 1987-3733927 | 19871007 |
| | CH 668984 | A | 19890215 | CH 1986-4063 | 19861010 |
| | WO 8802777 | A1 | 19880421 | WO 1987-EP590 | 19871009 |
| | W: AU, BB, BG, BR, DK, FI, HU, JP, KP, KR, LK, MC, MG, MW, NO, RO, SD, SU, US | | | | |
| | RW: AT, BE, BJ, CF, CG, CH, CM, DE, FR, GA, GB, IT, LU, ML, MR, NL, SE, SN, TD, TG | | | | |
| | AU 8780780 | A1 | 19880506 | AU 1987-80780 | 19871009 |
| PRAI | CH 1986-4063 | | 19861010 | | |
| | WO 1987-EP590 | | 19871009 | | |

AB  Cellular contents are released by subjecting the **cell** **suspension** to high-intensity elec. impulses. Thalictrum rugosum Cells were grown then subjected to elec. impulses in an electroporation app. Max. release of berberine was obsd. at field strengths of .apprx.5-10 kV/cm.
AB  Cellular contents are released by subjecting the **cell** **suspension** to high-intensity elec. impulses. Thalictrum rugosum Cells were grown then subjected to elec. impulses in an electroporation app. Max. release of berberine was obsd. at field strengths of .apprx.5-10 kV/cm.
ST  **electroporation** app **cell** content **release**; berberine release Thalictrum electroporation app
IT  **Electric** field, biological effects
      (**cell** contents **release** in relation to)
IT  Transformation, genetic
      (**cell** contents **release** response to, by **electroporation**)
IT  **Animal** cell
    Bacteria
    Chenopodium rubrum
    Fungi
      **Plant** cell
      **Yeast**
        (intracellular contents of, release of, elec. field effect on)
IT  2086-83-1, Berberine  7659-95-2, Betanin
    RL: BIOL (Biological study)
      (release from **plant** cells of, elec. field effect on)

L7  ANSWER 19 OF 23  BIOSIS  COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
AN  1988:357097  BIOSIS
DN  BA86:52575
TI  PERMEABILIZATION OF CULTIVATED **PLANT CELLS** BY **ELECTROPORATION** FOR **RELEASE** OF INTRACELLULARLY STORED SECONDARY PRODUCTS.
AU  BRODELIUS P E; FUNK C; SHILLITO R D
CS  INST. BIOTECHNOL., SWISS FED. INST. TECHNOL., HOENGGERBERG, CH-8093 ZURICH, SWITZERLAND.
SO  PLANT CELL REP, (1988) 7 (3), 186-188.
    CODEN: PCRPD8. ISSN: 0721-7714.
FS  BA; OLD
LA  English
AB  **Plant cell suspension** cultures producing secondary metabolites have been **permeabilized** for product **release** by **electroporation**. The two **cell** cultures studied, i.e. Thalictrum rugosum and Chenopodium rubrum, require

about 5 and 10 kV cm-1, respectively, for complete permeabilization (release of all the intracellularly stored product). The number of electrical pulses and capacitance used had a relatively limited effect on product release while the viability of the cells was strongly influenced by the latter. Conditions for complete product release resulted in total loss of viability of the **cells** after treatment. The **release** of product from immobilized **cells** was also achieved by **electroporation**. **Cells** entrapped in alginate required less voltage for permeabilization than free or agarose entrapped cells.

TI PERMEABILIZATION OF CULTIVATED **PLANT CELLS** BY **ELECTROPORATION** FOR **RELEASE** OF INTRACELLULARLY STORED SECONDARY PRODUCTS.

AB **Plant cell suspension** cultures producing secondary metabolites have been **permeabilized** for product **release** by **electroporation**. The two **cell** cultures studied, i.e. Thalictrum rugosum and Chenopodium rubrum, require about 5 and 10 kV cm-1, respectively, for complete permeabilization (release. . . cells was strongly influenced by the latter. Conditions for complete product release resulted in total loss of viability of the **cells** after treatment. The **release** of product from immobilized **cells** was also achieved by **electroporation** . **Cells** entrapped in alginate required less voltage for permeabilization than free or agarose entrapped cells.

L7 ANSWER 20 OF 23 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
AN 1984:237654 BIOSIS
DN BA77:70638
TI MEMBRANE POTENTIAL AND CATION PERMEABILITY A STUDY WITH A NYSTATIN RESISTANT MUTANT OF RHODOTORULA-GRACILIS RHODOSPORIDIUM-TORULOIDES.
AU HOEFER M; HUH H; KUENEMUND A
CS BOTANISCHES INST. UNIV. BONN, KIRSCHALLEE 1, 5300 BONN 1.
SO BIOCHIM BIOPHYS ACTA, (1983) 735 (2), 211-214.
CODEN: BBACAQ. ISSN: 0006-3002.
FS BA; OLD
LA English
AB Cells of a nystatin-resistant mutant of the obligatory aerobic **yeast** R. gracilis displayed an electrical potential, .DELTA..psi., across the plasma membrane which was, in contrast to the wild-strain cells, virtually independent of the pH of cell suspensions down to 4.5. In addition, the .DELTA..psi. in mutant cells was insensitive to extracellular K+ concentrations. The mutant cells failed to cotransport measurable amounts of H+ by the onset of monosaccharide transport and to take up K+ in exchange for H+. Taking into account the lower passive permeability of the mutant membrane for cations, the pH dependency of .DELTA..psi. in wild-strain cells is apparently correlated with the electrogenic leak of H+ back into the cells in course of increasing .DELTA.pH across the plasma membrane.
AB Cells of a nystatin-resistant mutant of the obligatory aerobic **yeast** R. gracilis displayed an electrical potential, .DELTA..psi., across the plasma membrane which was, in contrast to the wild-strain cells, virtually. . .
IT Miscellaneous Descriptors
AEROBIC PH **CELL SUSPENSION ELECTRICAL** POTENTIAL DIFFERENCE POTASSIUM CO TRANSPORT MONO SACCHARIDE PASSIVE **PERMEABILITY ELECTROGENIC** LEAK

L7 ANSWER 21 OF 23 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
AN 1981:215642 BIOSIS
DN BA72:626
TI A COMPARATIVE STUDY OF THE SEQUESTRATION OF ABNORMAL RED CELLS BY THE SPLEEN.
AU LEVESQUE M J; GROOM A C
CS DEP. OF BIOPHYSICS, HEALTH SCI. CENT., UNIV. OF WESTERN ONTARIO, 1151

RICHMOND ST., LONDON, ONT., CANADA N6A 5C1.
SO CAN J PHYSIOL PHARMACOL, (1980 (RECD 1981)) 58 (11), 1317-1325.
CODEN: CJPPA3. ISSN: 0008-4212.
FS BA; OLD
LA English
AB Splenic uptake of abnormal red cells, during a single transit, was studied using an isolated perfused cat spleen preparation. The organ was perfused at a constant pressure (60-65 mmHg; 1 mmHg = 133.322 Pa [Pascals]) with phosphate-buffered Ringer solution of pH 7.4 and equilibrated at 37.degree. C with 5% CO2 in O2. Venous pressure was maintained at 4-6 mmHg. When most of the red cells had been washed out a small bolus of **cell suspension**, consisting of 1.0 .times. 109 to 1.6 .times. 109 abnormal red cells, was injected into the arterial inflow and rapid, serial sampling of the outflow was carried out. **Cell** concentrations in the samples were measured by an **electrical** impedance type counter. The abnormal **cells** were autologous red **cells damaged** with heat (49.5.degree. C for 20 min), neuraminidase, N-ethylmaleimide (NEM) or glutaraldehye, red cells previously drained from the splenic pulp, or **human** red cells. There appears to be no single, key property of the cells that uniquely determines whether or not sequestration within the spleen will occur. Glutaraldehyde-treated cells (normal discoid shape but nondeformable) became trapped completely within the spleen and 90% of injected **human** red cells were retained. Autologous red cells from the splenic pulp and cells treated with neuraminidase or NEM (8-16 .mu.mol/ml) were all sequestered equally (75%) whereas only 57% of heat-treated cells became trapped. Cells damaged more severely by NEM (20-30 .mu.mol/ml) were retained to a smaller extent (30%). Marked saturation of the trapping mechanism occurred when 2nd or 3rd injections of abnormal cells were made. The extent of sequestration depends on the specific nature of the red cell abnormality, the degree of abnormality and the number of abnormal cells injected.
AB. . . pressure was maintained at 4-6 mmHg. When most of the red cells had been washed out a small bolus of **cell suspension**, consisting of 1.0 .times. 109 to 1.6 .times. 109 abnormal red cells, was injected into the arterial inflow and rapid, serial sampling of the outflow was carried out. **Cell** concentrations in the samples were measured by an **electrical** impedance type counter. The abnormal **cells** were autologous red **cells damaged** with heat (49.5.degree. C for 20 min), neuraminidase, N-ethylmaleimide (NEM) or glutaraldehye, red cells previously drained from the splenic pulp, or **human** red cells. There appears to be no single, key property of the cells that uniquely determines whether or not sequestration. . . spleen will occur. Glutaraldehyde-treated cells (normal discoid shape but nondeformable) became trapped completely within the spleen and 90% of injected **human** red cells were retained. Autologous red cells from the splenic pulp and cells treated with neuraminidase or NEM (8-16 .mu.mol/ml). . .
IT Miscellaneous Descriptors
CAT **HUMAN** SHAPE DEFORMABILITY HEAT DAMAGE NEURAMINIDASE N ETHYL MALEIMIDE GLUTARALDEHYDE

L7 ANSWER 22 OF 23 CAPLUS COPYRIGHT 2003 ACS
AN 1980:125264 CAPLUS
DN 92:125264
TI The effects of temperature and inhibitors of protein biosynthesis on the recovery from gas-shock of Acer pseudoplatanus cell cultures
AU Thoiron, Bernard; Thoiron, Arlette; Espejo, Jose; Le Guiel, Jeanne; Luettge, Ulrich; Thellier, Michel
CS Cent. Rech. Biol. Physiol. Cell., Fac. Sci., Mont-Saint-Aignan, F-76130, Fr.
SO Physiologia Plantarum (1980), 48(1), 161-7
CODEN: PHPLAI; ISSN: 0031-9317
DT Journal

LA English
AB The resumption of solute uptake capacity lost after gas-shock of A. pseudoplatanus **cell suspension** cultures was severely inhibited by low temps. (1.degree.) and by inhibitors of transcription and translation of protein synthesis such as 2-mercapto-1-(.beta.-4-pyridethyl)benzimidazole (MPB, 40 .mu.g/mL), puromycin (100 .mu.g/mL), and actinomycin (100 .mu.g/mL). Cells that have already attained max. uptake capacity loose it again after <1 h in 40 .mu.g/mL MPB. Gel-**electrophoresis** of the external media of the **cells** shows that the **release** of proteins into the soln. is affected by shock. The results demonstrate that proteins are involved in the mechanism of solute uptake by the cells, so that these proteins are among the factors altered during shock and recovery, and are important for the understanding of the after-effects of shock.
AB The resumption of solute uptake capacity lost after gas-shock of A. pseudoplatanus **cell suspension** cultures was severely inhibited by low temps. (1.degree.) and by inhibitors of transcription and translation of protein synthesis such as 2-mercapto-1-(.beta.-4-pyridethyl)benzimidazole (MPB, 40 .mu.g/mL), puromycin (100 .mu.g/mL), and actinomycin (100 .mu.g/mL). Cells that have already attained max. uptake capacity loose it again after <1 h in 40 .mu.g/mL MPB. Gel-**electrophoresis** of the external media of the **cells** shows that the **release** of proteins into the soln. is affected by shock. The results demonstrate that proteins are involved in the mechanism of solute uptake by the cells, so that these proteins are among the factors altered during shock and recovery, and are important for the understanding of the after-effects of shock.
ST biol transport protein temp **plant**; Acer transport coldshock protein; maple transport coldshock protein

L7 ANSWER 23 OF 23 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
AN 1978:185126 BIOSIS
DN BA65:72126
TI THE EFFECT OF ENCAPSULATION IN RED BLOOD CELLS ON THE DISTRIBUTION OF METHOTREXATE IN MICE.
AU ZIMMERMANN U; PILWAT G; ESSER B
CS INST. BIOPHYS. CHEM./ICH 2, KERNFORSCHUNGSANLAGE, JUELICH GMBH, POSTFACH 1913, D-5170 JUELICH, W. GER.
SO J CLIN CHEM CLIN BIOCHEM, (1978) 16 (2), 135-144.
CODEN: JCCBDT. ISSN: 0340-076X.
FS BA; OLD
LA English
AB Red blood cell ghosts containing entrapped methotrexate were injected into mice. The distribution pattern of the antitumor drug among different organs was markedly different from that observed after injection of free methotrexate. Methotrexate is trapped inside mouse and **human** red blood cell ghosts by application of an electric field pulse of 8 and 12 kV/cm, respectively, for 40 .mu.s through an isotonic red blood **cell suspension** containing 5 mmol/l methotrexate between 0-4.degree. C. The **electrical** field induces a **permeability** change of the **cell** membrane, which results from the dielectric breakdown of the cell membrane, leading to an exchange of ions and macromolecules between the cell interior and the external medium containing the drug. After resealing by raising the temperature to 37.degree. C, the cells contained about 5 mmol/l methotrexate. The methotrexate-loaded ghost population, obtained from mouse or **human** red blood cells, was electrically homogeneous as shown by dielectric breakdown measurements using a hydrodynamic focusing Coulter counter. Twenty-five micrograms methotrexate labeled with 22 kBq [3',5',9(n)-3H]methotrexate (specific activity 0.63 TBq/mmol) trapped inside **human** or mouse ghost cells was injected into the tail vein of mice (about 20 g body wt). Nearly all of the entrapped methotrexate accumulated in the liver, whereas in control experiments only 0.25 of the injected dose accumulated in the liver. This carrier system

can be made specific for other organs by entrapping, in addition to the drug, small para-, ferro- or ferrimagnetic particles of 4-20 nm in diameter, and using an external magnetic guide.

AB. . . among different organs was markedly different from that observed after injection of free methotrexate. Methotrexate is trapped inside mouse and **human** red blood cell ghosts by application of an electric field pulse of 8 and 12 kV/cm, respectively, for 40 .mu.s through an isotonic red blood **cell suspension** containing 5 mmol/l methotrexate between 0-4.degree. C. The **electrical** field induces a **permeability** change of the **cell** membrane, which results from the dielectric breakdown of the cell membrane, leading to an exchange of ions and macromolecules between. . . the temperature to 37.degree. C, the cells contained about 5 mmol/l methotrexate. The methotrexate-loaded ghost population, obtained from mouse or **human** red blood cells, was electrically homogeneous as shown by dielectric breakdown measurements using a hydrodynamic focusing Coulter counter. Twenty-five micrograms methotrexate labeled with 22 kBq [3',5',9(n)-3H]methotrexate (specific activity 0.63 TBq/mmol) trapped inside **human** or mouse ghost cells was injected into the tail vein of mice (about 20 g body wt). Nearly all of. . .

IT Miscellaneous Descriptors

**HUMAN** ANTI NEOPLASTIC-DRUG LIVER LEVEL

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